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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF PREVENTION, PESTICIDES AND TOXIC SUBSTANCES

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SECTION 18 REVIEW

SUBJECT: Myclobutanil on Cucurbits in Virginia

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A. Risk Characterization Summary

The proposed use of myclobutanil on cucurbits in the Commonwealth of Virginia does not appear to pose adverse effects to birds, fish, small mammals and aquatic invertebrates. Risk to terrestrial species of plants and non-target insects could not be assessed due to lack of data; therefore, risk to plants and non-target insects remains a possibility and could be minimized by taking precautions to minimize spray drift.

B. Submission Purpose

The Virginia Department of Agriculture and Consumer Services has applied for a special exemption to use Nova 40W fungicide containing myclobutanil to control powdery mildew (*Sphaerotheca fuliginea*) on a total estimated 14,000 acres of cucurbits crops grown in its state. For the June through October 1998 season, the maximum estimate for the total required active ingredient is 4,200 lb ai (10,500 fl oz of Nova). This is based on three applications of 4 oz. (0.1 lb ai) per acre each, with an interval of 10 days between application and 1-day pre-harvest. Applications are to be made using foliar spray (ground or aerial), at the beginning of disease detection. Contact fungicides (copper, sulfur, chlorothalanil) are effective against powdery mildew at the site deposited, but do not provide adequate protection for the undersides of the leaves, since those fungicides are not systemic. Several systemic fungicides currently registered in



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the U.S. for this disease are no longer adequately effective because of resistance. Myclobutanil is proposed for use in alternation with Quadris (azoxystrobin) to implement a fungicide resistance management program. This program was proven to provide adequate fungicide coverage under lower leaf surfaces where conditions are more favorable for the development of the powdery mildew, than on the upper surfaces. Myclobutanil is currently registered in Delaware for use on crops such as apples, stone fruits and grapes; however, this is the first request for the use of this fungicide on cucurbits in this state.

Product Information:

Product Name: Rally 40 WSP manufactured by Rohm and Haas Co.

Active Ingredient: Myclobutanil.....40%

Inert Ingredients.....60%

Rally 40 WSP contains 3.2 lb ai/gallon of product.

C. Environmental Assessment

1. Environmental Fate and Exposure Characterization

Summary of Selected Environmental Fate Properties for Myclobutanil

Property	Range	Value used in assessment	Model
Solubility (water)	142 mg/L	142 mg/L	GENEEC
Hydrolysis $t_{1/2}$	stable at pH 5, 7 and 9	stable - (0 day)	GENEEC
Aquatic Photolysis $t_{1/2}$	stable	stable - (0 day)	GENEEC
Aerobic Soil Metabolism $t_{1/2}$	61-71 days in silt loam, but degradation rates slowed after increasing aging, and after 240 days, 34-37% of parent was still present.	see Terrestrial Field Dissipation	GENEEC FATE
Terrestrial Field Dissipation $t_{1/2}$	292 days in sandy loam, 92 days in loam soil	129 days = average of aerobic soil metabolism half-lives and terrestrial field dissipation half-lives	GENEEC FATE
Anaerobic Soil Metabolism $t_{1/2}$	no appreciable degradation in 62 days	not considered	
Aerobic Aquatic Metabolism $t_{1/2}$	no data	(0 day)	
K_{ad}	1.46, 2.39, 4.44, 7.08, 9.77	see K_{oc} values	
K_{oc}	224, 265, 581, 595, 936	581 = median	GENEEC

2. Estimated Environmental Concentrations

Aquatic:

The aquatic EECs presented below were generated using the GENEEC computer program developed by EFED. This program uses a variety of environmental fate parameters listed in above table, in conjunction with the application rate to estimate the exposure to aquatic organisms from runoff. With an application rate of 0.1 lb a.i./A and 3 applications with 10-day interval per year, the GENEEC simulation model for ground application yields a peak EEC value of 5.3 ppb and an average 56-day EEC of 4.2 ppb.

GENEEC EECs (ppb):

INPUT VALUES

RATE (#/AC) ONE(MULT)	APPLICATIONS NO.-INTERVAL	SOIL KOC	SOLUBILITY (PPM)	% SPRAY DRIFT	INCRP DEPTH(IN)
.100 (.285)	3 10	581.0	142.0	1.0	0

FIELD AND STANDARD POND HALFLIFE VALUES (DAYS)

METABOLIC (FIELD)	DAYS UNTIL RAIN/RUNOFF	HYDROLYSIS (POND)	PHOTOLYSIS (POND-EFF)	METABOLIC (POND)	COMBINED (POND)
129.00	0	N/A	0.00-0.00	0.00	0

GENERIC EECs (IN PPB)

PEAK GEEC	AVERAGE 4 DAY GEEC	AVERAGE 21 DAY GEEC	AVERAGE 56 DAY GEEC
5.32	5.24	4.82	4.24

Terrestrial:

The following terrestrial data were generated using the FATE computer program developed by EFED. This program uses the environmental fate parameters listed in table of section C. 1., in conjunction with the application rate (0.1 lb a.i./A and 3 applications with 10-day interval per year) to estimate the exposure to terrestrial organisms.

Acute EECs (ppm):

Vegetation Type	Maximum EEC ¹	Average EEC ¹
Short grass	68 ppm	47 ppm
Tall grass	31 ppm	21 ppm
Broadleaf plants/insects	38 ppm	26 ppm
Fruits/seeds	4.3 ppm	2.9 ppm

¹ Initial concentration was the maximum Kenaga value for the vegetation type. Average EEC is for the 30-day period following the initial application.

Chronic EECs (ppm):

Vegetation Type	Maximum EEC ¹	Average EEC ¹
Short grass	24 ppm	16 ppm
Tall grass	10 ppm	7.0 ppm
Broadleaf plants/insects	13 ppm	8.7 ppm
Fruits/seeds	2.0 ppm	1.4 ppm

¹ Initial concentration was the mean Fletcher value for the vegetation type. Average EEC is for a 30-day period from the initial application.

3. Ecological Toxicity Data Summary

The following toxicity data has been reviewed in conjunction with the registration of myclobutanil.

Terrestrial Wildlife Toxicity Data:

Common Name	%AI	Toxicity	NOEL	EPA-ID	Category
Bobwhite Quail	84.5	LD ₅₀ 510 mg/Kg		0144286	C
Bobwhite Quail	84.5	LC ₅₀ >5000 ppm		0144287	C
Mallard Duck	84.5	LC ₅₀ >5000 ppm		0144287	C
Bobwhite Quail	94.2	LOEC >260 ppm	260 ppm	43087901	S
Mallard Duck	94.2	LOEC >260 ppm	260 ppm	43087902	S
Laboratory rat	91.9	Acute oral LD ₅₀ =1360 g/kg		006370	C
Laboratory rat	84.5	2-gen. Repro LOEL=1000 ppm	200 ppm	004936	C
Laboratory rat	84.5	2-gen. Systemic LOEL=200 ppm	50 ppm	004936	C

Aquatic Organism Toxicity Data:

Common Name	%AI	Toxicity	NOEL	EPA-ID	Category
Bluegill sunfish	84.5	96 HR LC ₅₀ =2.4 ppm		0144285	C
Rainbow trout	84.5	96 HR LC ₅₀ =4.2 ppm		0141677	C
Water flea	84.5	48 HR EC ₅₀ =11 ppm		0141678	C
Sheepshead minnow	93	96 HR LC ₅₀ =4.7 ppm		42747903	C
Eastern oyster	93	96 HR EC ₅₀ =0.68 ppm		42747901	S
Mysid	93	96-HR LC ₅₀ =0.24 ppm		42747902	C
Fathead minnow		Early life LOEC=2.2 ppm	0.98 ppm	0266119	S

4. Hazard Assessment

Hazard to Terrestrial Organisms:

Acute Risk Quotients (RQs):

Vegetation Type	Max EEC	Avian acute RQ—max	Mammal acute RQ—max ¹
Short grass	69	0.01	0.05
Tall grass	31	0.01	0.02
Broadleaf plants/insects	38	0.01	0.03
Fruits/Seeds	4.3	<0.01	<0.01

¹Based on a calculated mammal LC50 of 1432 ppm for a small mammal consuming 95% of its BW (LD50/% BW consumed)

No acute level of concern (LOC) is exceeded for birds and mammals from the proposed use of myclobutanil on cucurbits.

Chronic Risk Quotients (RQs):

Vegetation Type	Average EEC ¹	Avian Chronic RQ	Mammalian Chronic RQ: Reproductive Systemic	
Short grass	16.5 ppm	0.06	0.08	0.33
Tall grass	7.0 ppm	0.03	0.03	0.14
Broadleaf plants/insects	8.7 ppm	0.03	0.04	0.17
Fruits/seeds	1.4 ppm	0.01	0.01	0.03

¹Average concentration over time (30 day period)—modeled using FATE program with mean Fletcher value as initial input.

No chronic LOC is exceeded for birds and mammals from the proposed use of myclobutanil on cucurbits.

Hazard to Aquatic Organisms:

Acute Risk Quotients (RQs):

Species	LC ₅₀ or EC ₅₀ (ppm)	Peak GENE EEC (ppm)	RQ
Bluegill sunfish	2.4	0.005	<0.01
Rainbow trout	4.2	0.005	<0.01
Water flea	11	0.005	<0.01
Sheepshead minnow	4.7	0.005	<0.01
Eastern oyster	0.68	0.005	0.01
Mysid	0.24	0.005	0.02

No acute LOCs are exceeded for marine/estuarine invertebrates and freshwater mollusks from the proposed use of myclobutanil on cucurbits.

Chronic: The fish early life-stage NOEC (0.98 ppm) was compared to the 56-day GENEEC value (0.004 ppm); no chronic hazard was indicated for the proposed use of myclobutanil on cucurbits.

Hazard to Terrestrial Plants: No data on toxicity of myclobutanil to terrestrial species of plants has been reviewed to date. Therefore, no conclusions regarding possible hazard to these species groups can be made at this time.

Hazard to Non-Target Insects Toxicity Data: No data has been received for review by the Agency regarding toxicity to non-target insects. Therefore, no conclusions regarding possible hazard to these species groups can be made at this time.

Hazard to Endangered Species: Based on toxicity data and predicted environmental concentrations, minimal risk is expected to endangered birds, mammals, fish, and aquatic invertebrates. The lack of terrestrial plant data and non-target insect toxicity data precludes any determination of hazard for these species groups. A list of endangered and threatened plants and insects in the Commonwealth of Virginia is attached for your information.

D. Labeling Recommendations

Section 18 Label

Do not apply directly to water, or to areas below the mean high-water mark. Do not contaminate water when disposing of equipment washwater or rinsates.

Product Label

For terrestrial uses, do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters. Do not apply when weather conditions favor drift or runoff from areas treated.

ACCOMACK VA

SPECIES	GROUP	STATUS	KNOWN
BEETLE, NORTHEASTERN BEACH TIGER	INSECT	T	KNOWN

ALLEGHANY VA

SPECIES	GROUP	STATUS	KNOWN
CONEFLOWER, SMOOTH	PLANT	E	POSSIBLE
BULRUSH, NORTHEASTERN (=BARBED BRISTLE)	PLANT	E	KNOWN
ROCK-CRESS, SHALE BARREN	PLANT	E	KNOWN

APPOMATTOX VA

SPECIES	GROUP	STATUS	KNOWN
POGONIA, SMALL WHORLED	PLANT	T	KNOWN

AUGUSTA VA

SPECIES	GROUP	STATUS	KNOWN
BULRUSH, NORTHEASTERN (=BARBED BRISTLE)	PLANT	E	KNOWN
ORCHID, EASTERN PRAIRIE FRINGED	PLANT	T	KNOWN
PINK, SWAMP	PLANT	T	KNOWN
ROCK-CRESS, SHALE BARREN	PLANT	E	KNOWN

BATH VA

SPECIES	GROUP	STATUS	KNOWN
BULRUSH, NORTHEASTERN (=BARBED BRISTLE)	PLANT	E	KNOWN
ROCK-CRESS, SHALE BARREN	PLANT	E	KNOWN

BUCKINGHAM VA

SPECIES	GROUP	STATUS	KNOWN
POGONIA, SMALL WHORLED	PLANT	T	KNOWN

CONEFLOWER, SMOOTH

PLANT

E

KNOWN

CAROLINE VA

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SPECIES

GROUP

STATUS

KNOWN

PINK, SWAMP

PLANT

T

KNOWN

POGONIA, SMALL WHORLED

PLANT

T

KNOWN

CARROLL VA

=====

SPECIES

GROUP

STATUS

KNOWN

SPIRAEA, VIRGINIA

PLANT

T

POSSIBLE

CHARLES CITY VA

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SPECIES

GROUP

STATUS

KNOWN

JOINT-VETCH, SENSITIVE

PLANT

T

KNOWN

DICKENSON VA

=====

SPECIES

GROUP

STATUS

KNOWN

SPIRAEA, VIRGINIA

PLANT

T

KNOWN

DINWIDDIE VA

=====

SPECIES

GROUP

STATUS

KNOWN

SUMAC, MICHAUX'S

PLANT

E

POSSIBLE

ESSEX VA

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SPECIES

GROUP

STATUS

KNOWN

JOINT-VETCH, SENSITIVE

PLANT

T

KNOWN

CONEFLOWER, SMOOTH	PLANT	E	KNOWN
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GILES VA

SPECIES	GROUP	STATUS	KNOWN
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MALLOW, PETER'S MOUNTAIN	PLANT	E	KNOWN
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GLOUCESTER VA

SPECIES	GROUP	STATUS	KNOWN
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POGONIA, SMALL WHORLED	PLANT	T	KNOWN
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GRAYSON VA

SPECIES	GROUP	STATUS	KNOWN
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SPIRAEA, VIRGINIA	PLANT	T	KNOWN
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GREENSVILLE VA

SPECIES	GROUP	STATUS	KNOWN
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CHAFFSEED, AMERICAN	PLANT	E	POSSIBLE
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HALIFAX VA

SPECIES	GROUP	STATUS	KNOWN
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CONEFLOWER, SMOOTH	PLANT	E	POSSIBLE
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HENRICO VA

SPECIES	GROUP	STATUS	KNOWN
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PINK, SWAMP	PLANT	T	KNOWN
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ROCK-CRESS, SHALE BARREN

PLANT

E

KNOWN

JAMES CITY VA

SPECIES	GROUP	STATUS	KNOWN
JOINT-VETCH, SENSITIVE	PLANT	T	KNOWN
POGONIA, SMALL WHORLED	PLANT	T	KNOWN

KING AND QUEEN VA

SPECIES	GROUP	STATUS	KNOWN
JOINT-VETCH, SENSITIVE	PLANT	T	KNOWN

KING GEORGE VA

SPECIES	GROUP	STATUS	KNOWN
JOINT-VETCH, SENSITIVE	PLANT	T	KNOWN

KING WILLIAM VA

SPECIES	GROUP	STATUS	KNOWN
JOINT-VETCH, SENSITIVE	PLANT	T	KNOWN
POGONIA, SMALL WHORLED	PLANT	T	POSSIBLE

LANCASTER VA

SPECIES	GROUP	STATUS	KNOWN
BEETLE, NORTHEASTERN BEACH TIGER	INSECT	T	KNOWN

LEE VA

SPECIES	GROUP	STATUS	KNOWN
POGONIA, SMALL WHORLED	PLANT	T	POSSIBLE

BEETLE, NORTHEASTERN BEACH TIGER	INSECT	T	KNOWN
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MIDDLESEX VA

SPECIES	GROUP	STATUS	KNOWN
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BEETLE, NORTHEASTERN BEACH TIGER	INSECT	T	KNOWN
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MONTGOMERY VA

SPECIES	GROUP	STATUS	KNOWN
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CONEFLOWER, SMOOTH	PLANT	E	KNOWN
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NELSON VA

SPECIES	GROUP	STATUS	KNOWN
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PINK, SWAMP	PLANT	T	KNOWN
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NEW KENT VA

SPECIES	GROUP	STATUS	KNOWN
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JOINT-VETCH, SENSITIVE	PLANT	T	KNOWN
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POGONIA, SMALL WHORLED	PLANT	T	KNOWN
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NORTHAMPTON VA

SPECIES	GROUP	STATUS	KNOWN
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BEETLE, NORTHEASTERN BEACH TIGER	INSECT	T	KNOWN
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NORTHUMBERLAND VA

SPECIES	GROUP	STATUS	KNOWN
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BEETLE, NORTHEASTERN BEACH TIGER	INSECT	T	KNOWN
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CONEFLOWER, SMOOTH
SUMAC, MICHAUX'S

PLANT
PLANT

E
E

KNOWN
POSSIBLE

PAGE VA

SPECIES	GROUP	STATUS	KNOWN
ROCK-CRESS, SHALE BARREN	PLANT	E	KNOWN

PATRICK VA

SPECIES	GROUP	STATUS	KNOWN
BITTERCRESS, SMALL-ANTHERED	PLANT	E	KNOWN

PRINCE GEORGE VA

SPECIES	GROUP	STATUS	KNOWN
JOINT-VETCH, SENSITIVE	PLANT	T	KNOWN

PRINCE WILLIAM VA

SPECIES	GROUP	STATUS	KNOWN
POGONIA, SMALL WHORLED	PLANT	T	KNOWN

PULASKI VA

SPECIES	GROUP	STATUS	KNOWN
CONEFLOWER, SMOOTH	PLANT	E	KNOWN

ROANOKE VA

SPECIES	GROUP	STATUS	KNOWN
CONEFLOWER, SMOOTH	PLANT	E	KNOWN

ROCK-CRESS, SHALE BARREN	PLANT	E	KNOWN
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ROCKINGHAM VA

SPECIES	GROUP	STATUS	KNOWN
BULRUSH, NORTHEASTERN (=BARBED BRISTLE)	PLANT	E	KNOWN

SHENANDOAH VA

SPECIES	GROUP	STATUS	KNOWN
ROCK-CRESS, SHALE BARREN	PLANT	E	KNOWN

SMYTH VA

SPECIES	GROUP	STATUS	KNOWN
BIRCH, VIRGINIA ROUND-LEAF	PLANT	T	KNOWN

STAFFORD VA

SPECIES	GROUP	STATUS	KNOWN
JOINT-VETCH, SENSITIVE	PLANT	T	KNOWN
POGONIA, SMALL WHORLED	PLANT	T	KNOWN

SURRY VA

SPECIES	GROUP	STATUS	KNOWN
JOINT-VETCH, SENSITIVE	PLANT	T	POSSIBLE

SUSSEX VA

SPECIES	GROUP	STATUS	KNOWN
CHAFFSEED, AMERICAN	PLANT	E	POSSIBLE

JOINT-VETCH, SENSITIVE

PLANT

T

KNOWN

WISE VA

SPECIES	GROUP	STATUS	KNOWN
SPIRAEA, VIRGINIA	PLANT	T	KNOWN
POGONIA, SMALL WHORLED	PLANT	T	POSSIBLE